PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
71T0550.WO1		

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IT 03/00372	13.06.2003	26.06.2002

International Patent Classification (IPC) or both national classification and IPC
E06B3/96

Applicant
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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
03.12.2003	03.08.2004

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT 03/00372

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1, 3-10	as originally filed
2, 2bis	received on 22.04.2004 with letter of 21.04.2004

Claims, Numbers

1-9	received on 22.04.2004 with letter of 21.04.2004

Drawings, Sheets

1/5-5/5	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents, also cited by the applicant:

D1: DE-A-70 00 649
D2: DE-U-93 08 539

2 The invention relates to:

Preamble of claim 1:
A manufacturing process for wood and aluminium window and door frames, or frames made of PVC or other materials, comprising the stages of:
- working of solid wood or wood-panel components to create housings with linear transversal shaped for housing metal elements, or PVC elements;
- assembly of the above-mentioned components to create fixed and mobile frames, the assembly being done by joining the cross-pieces and the uprights of the frames using metal corner brackets, positioned at the four corners of the frames, and straps, or other elements which resist traction, stretched about the frames;
- fixture with screw means of the metal or PVC elements, in the housings made in the internal sides of the fixed frames and the external frames of the mobile frames;
- application to the fixed and mobile frames of hinges, seals and other mechanical components destined to guarantee closure, opening and in general good functioning of the frames.

Claim 5:
A corresponding frame.

Claim 7:
A corresponding joint for union of elements to be used as cross-pieces and uprights.

2.1 A relevant prior art may be found in document D1 showing a manufacturing process according to the preamble of claim 1 and a related frame. D2 discloses a joint for union of cross-pieces and uprights, comprising a tension rod between movable blocks.

3 The subject-matter of **claim 1** is new and also inventive for the following reasons (Articles 33(2)&(3) PCT):

Problem: To provide a process which employs simpler machinery and therefore results in lower costs.

The solution according to claim 1 is essentially given by the application of threaded pivots with straps stretched between their two ends so as to exert a traction on two sides of the corner of the frame.

3.1 None of the documents cited in the research report indicate this solution, nor give hints which in combination could lead thereto. The solution of document D1, see figure 1, teaches the application of a tensioning strap but lacks the component of a threaded pivot entirely. Document D2 shows a joint in the form of a tensioning rod between movable blocks.

3.2 The industrial applicability is also given (Article 33(4) PCT).

4 The related frames according to **claim 5** of obvious reasons also fulfils the requirements of Article 33 PCT.

5 The subject-matter of **claim 7** is new and also inventive for the following reasons (Articles 33(2)&(3) PCT):

Problem: To provide a setup for a joint for union of elements to be used as cross-pieces and uprights of a frame which is simple and therefore results in lower costs.

The solution according to claim 7 is essentially given by the application of a tension-rod functioning pivot between at least one block comprising means for

tensioning with which an interaction between the end of the pivot and the at least one block can be actuated.

5.1 None of the documents cited in the research report indicate this solution, nor give hints which in combination could lead thereto. The solution of document D1, see figure 1, teach the application of a tensioning strap but lacks the component of a threaded pivot entirely. Document D2 shows a joint in the form of a tensioning rod between movable blocks.

5.2 The industrial applicability is also given (Article 33(4) PCT).

6 Dependent claims 2-4, 6 and 8-9 concern advantageous further developments of the subject-matter according to claim 1, 5 and 7, respectively. They fulfil therefore as well the requirements of Article 33 PCT as regards novelty, inventive step and industrial applicability.

Frames belonging to the "wood-aluminium" category are basically obtained using traditional wooden frame principles; they are specially shaped and glued to form the base structure of the frame, whether this is in relation to a fixed frame, a wall, or to a mobile window or door with respect to a fixed frame. The wooden elements of the structures are also subject to mechanical operations, made using specific tools to obtain the details and special shaping required for fitting together with the aluminium protection elements.

Frames made using the above methods are certainly better protected from weathering with respect to traditional wooden frames, but involve increased production costs due to the expensive tools needed, the machinery necessary for creating the special elements, and also because of the level of waste associated with the above-mentioned work operations.

Frames produced using the "aluminium-wood" approach are also characterised by high production costs, largely because production with aluminium technology is more expensive than with wood technology, but also because then wood has to be added to the internal side of the frame. To make matters worse, the end product still has a "mechanical" rather than the "warm" aspect one would traditionally associate with wood.

DE-A-7000649 discloses "A manufacturing process for wood and aluminium window and door frames or frames made of PVC or other materials, comprising the stage of :

- working of solid wood or wood-panel components to create housing with linear transversal shaped for housing metal elemets , or PVC elements;

- assembly of the above-mentioned components to create fixed and mobile frames, the assembly being done by joining the cross-pieces and the uprights of the frames using metal corner brackets positioned at the four corners of the frames, and straps or other elements which resist traction, stretched about the

frames;

- fixture with screw means of the metal or PVC elements (7),in the housing made in the internal sides of the fixed frames and the external frames of the mobile frames;

- application to the fixed and mobile frames of hinges seals and other mechanical components destined to grarantee closure, opening and in general good functioning of the frames".

DE-U-9308539 discoses a joint for union of cross-pieces and uprights, comprising a tension-rod between movable blocks.

The main aim of the present invention is to provide a manufacturing process for frames in wood and aluminium, or PVC or other materials, which employs simpler machinery and results in lower production costs with respect to present processes.

A further aim of the invention is to provide a manufacturing process for obtaining wood and aluminium, PVC or other material frames which are easy to assemble and just as easily dismounted, so that assembly can be done at the workplace, as well as repairs, maintenance or replacement of components.

A further aim of the invention is to provide wood and aluminium, or PVC or

Claims.

1). A manufacturing process for wood and aluminium window and door frames, or frames made of PVC or other materials, comprising stages of:
- working of solid wood or wood-panel components to create housings with linear transversal shapes for housing metal elements, or PVC elements;
- assembly of the above-mentioned components to create fixed and mobile frames, the assembly being done by joining the cross-pieces and the uprights of the frames using metal corner-brackets, positioned at the four corners of the frames, and straps, or other elements which resist traction, stretched about the frames;
- fixture with screw means of the metal or PVC elements, in the housings made in the internal sides of the fixed frames and the external frames of the mobile frames;
- application to the fixed and mobile frames of hinges, seals and other mechanical components destined to guarantee closure, opening and in general good functioning of the frames,

~~2). The manufacturing process of claim 1,~~ wherein the assembly of the wooden components for making fixed and mobile frames is done by joining the cross-pieces (13') and the uprights (11') of the frames (10') with use of metal corner-brackets (16), threaded pivots (21) positioned obliquely at corners of the frame, and straps (18) stretched between two ends (19, 20) of the threaded pivots (21) in such a way as to exert a traction on two sides of the corner of an intensity which obtains a perfect join of the cross-pieces (13') and the uprights (11') forming the corner.

2). ~~3).~~ The manufacturing process for frames of claim 1, wherein the assembly

of the wooden components for realising the fixed and mobile frames is done by joining the cross-pieces (13') and the uprights (11') of the frames (10') with the use of threaded pivots (21) passing obliquely at corners of the frame, and corner-brackets (16') ends of which are constrained to pivots (51, 52) which are slidable with respect to housings (53, 54) lodged entirely in cavities afforded in the cross-pieces (13') and in the uprights (11') at positions corresponding to ends (19', 20') of the threaded pivot (21'); traction being exerted by means of screws (57, 58) interacting between the housings (53, 54) and supports (59, 60) of the pivots (51, 52), which traction guarantees an exact corner coupling of the cross-pieces (13') and the uprights (11').

3). ~~4).~~ The manufacturing process for frames of claim *2* ~~3~~, wherein the housings (15, 28, 35) of the metal elements (24, 25, 31) are transversally L-shaped and are created by cutting wooden components (11, 26, 12) of the frames (10) in a longitudinal direction.

4). ~~5).~~ The manufacturing process of any one of the preceding claims, comprising an application of external protection guards (29, 29') made of aluminium or PVC, by pressure-constraining the guards (29, 29') between the metal elements and the wooden frame, or between the window glass frame channels and the wooden frames.

5). ~~6).~~ Wooden and aluminium frames, or PVC frames or frames made of another material, comprising:

frames made of solid wood or wood in panel form, assembled by joining cross-pieces and uprights of the frames, with use of metal corner-brackets, positioned at four corners of the frames, and straps, or other elements which are resistant to traction, stretched about the frames;

housings with linear transversal profiles afforded in the wooden frames for housing metal or PVC elements;

metal or PVC elements fixed by means of screws to fixed and mobile frames of the frames, respectively in housings made in internal sides of the fixed frames and in external sides of the mobile frames;

hinges, seals and other mechanical components for guaranteeing closure, opening and operation of the frames, ***said***

~~7). The~~ frames ~~of claim 6,~~ comprising fixed frames and mobile frames, assembled together by joining cross-pieces (13') and uprights (11') of the frames (10') with use of metal corner-pieces (16), threaded pivots (21) passing obliquely at corners of the frame, and straps (18) stretched between two ends (19, 20) of the threaded pivots (21) in such a way as to exert a traction on two sides of the corner of an intensity which obtains a perfect join of the cross-pieces (13') and the uprights (11') forming the corner.

6). ~~8)~~ The frames of claim 6, comprising fixed frames and mobile frames assembled by joining the cross-pieces (13') and the uprights (11') of the frames (10') with the use of threaded pivots (21) passing obliquely at corners of the frame, and corner-brackets (16') ends of which are constrained to pivots (51, 52) which are slidable with respect to housings (53, 54) lodged entirely in cavities afforded in the cross-pieces (13') and in the uprights (11') at ends (19', 20') of the pivot (21'); traction being exerted by means of screws (57, 48) interacting between the housings (53, 54) and supports (59, 60) of the pivots (51, 52), which traction guarantees an exact corner coupling of the cross-pieces (13') and the uprights (11').

7). ~~9).~~ A joint for union of elements to be used as cross-pieces (130) and uprights (110) comprising: at least one joint pivot (210) having a tension-rod function, housed snugly and coaxially inside a cylindrical housing (200) predisposed in a reciprocally-coupled cross-piece (130) and an upright (110); at least one block (530, 540), for interacting with means which are associable to the ends of the

joint pivot (210) for placing the tension-rod in a state of tension; ***said means normally comprising screws 300 with which an interaction can be actuated between the ends of the joint pivot 210 and the blocks 530, 540 which enable the joint pivot 210 to be placed under tension***; the block (530, 540) being predisposed to be snugly housed in cavities (250) afforded in the cross-piece (130) and the upright (110); the block (530, 540) being shaped in such a way as to restore the shape of the element, cross-piece 130 or upright (110) when housed in the relative cavity (250) in which the cavity (250) is afforded.

8). ~~10).~~ The joint of claim ***7*** ~~9~~, wherein the means associable to the ends of the joint pivot (210) for realising the tensioning of the joint pivot (210) comprise screws (300).

9). ~~11).~~ The joint of claim ***8*** ~~10~~, wherein the block (530, 540) is delimited by a straight circular cylindrical surface dimensioned in order to afford a snug housing thereof in the cavities located in the cross-piece (130) and the upright (110).

Frames belonging to the "wood-aluminium" category are basically obtained using traditional wooden frame principles; they are specially shaped and glued to form the base structure of the frame, whether this is in relation to a fixed frame, a wall, or to a mobile window or door with respect to a fixed frame. The wooden elements of the structures are also subject to mechanical operations, made using specific tools to obtain the details and special shaping required for fitting together with the aluminium protection elements.

Frames made using the above methods are certainly better protected from weathering with respect to traditional wooden frames, but involve increased production costs due to the expensive tools needed, the machinery necessary for creating the special elements, and also because of the level of waste associated with the above-mentioned work operations.

Frames produced using the "aluminium-wood" approach are also characterised by high production costs, largely because production with aluminium technology is more expensive than with wood technology, but also because then wood has to be added to the internal side of the frame . To make matters worse, the end product still has a "mechanical" rather than the "warm" aspect one would traditionally associate with wood.

The main aim of the present invention is to provide a manufacturing process for frames in wood and aluminium, or PVC or other materials, which employs simpler machinery and results in lower production costs with respect to present processes.

A further aim of the invention is to provide a manufacturing process for obtaining wood and aluminium, PVC or other material frames which are easy to assemble and just as easily dismounted, so that assembly can be done at the workplace, as well as repairs, maintenance or replacement of components.

A further aim of the invention is to provide wood and aluminium, or PVC or

Claims.

1). A manufacturing process for wood and aluminium window and door frames, or frames made of PVC or other materials, comprising stages of:

- working of solid wood or wood-panel components to create housings with linear transversal shapes for housing metal elements, or PVC elements;
- assembly of the above-mentioned components to create fixed and mobile frames, the assembly being done by joining the cross-pieces and the uprights of the frames using metal corner-brackets, positioned at the four corners of the frames, and straps, or other elements which resist traction, stretched about the frames;
- fixture with screw means of the metal or PVC elements, in the housings made in the internal sides of the fixed frames and the external frames of the mobile frames;
- application to the fixed and mobile frames of hinges, seals and other mechanical components destined to guarantee closure, opening and in general good functioning of the frames.

2). The manufacturing process of claim 1, wherein the assembly of the wooden components for making fixed and mobile frames is done by joining the cross-pieces (13') and the uprights (11') of the frames (10') with use of metal corner-brackets (16), threaded pivots (21) positioned obliquely at corners of the frame, and straps (18) stretched between two ends (19, 20) of the threaded pivots (21) in such a way as to exert a traction on two sides of the corner of an intensity which obtains a perfect join of the cross-pieces (13') and the uprights (11') forming the corner.

3). The manufacturing process for frames of claim 1, wherein the assembly of the

wooden components for realising the fixed and mobile frames is done by joining the cross-pieces (13') and the uprights (11') of the frames (10') with the use of threaded pivots (21) passing obliquely at corners of the frame, and corner-brackets (16') ends of which are constrained to pivots (51, 52) which are slidable with respect to housings (53, 54) lodged entirely in cavities afforded in the cross-pieces (13') and in the uprights (11') at positions corresponding to ends (19', 20') of the threaded pivot (21'); traction being exerted by means of screws (57, 58) interacting between the housings (53, 54) and supports (59, 60) of the pivots (51, 52), which traction guarantees an exact corner coupling of the cross-pieces (13') and the uprights (11').

4). The manufacturing process for frames of claim 3, wherein the housings (15, 28, 35) of the metal elements (24, 25, 31) are transversally L-shaped and are created by cutting wooden components (11, 26, 12) of the frames (10) in a longitudinal direction.

5). The manufacturing process of any one of the preceding claims, comprising an application of external protection guards (29, 29') made of aluminium or PVC, by pressure-constraining the guards (29, 29') between the metal elements and the wooden frame, or between the window glass frame channels and the wooden frames.

6). Wooden and aluminium frames, or PVC frames or frames made of another material, comprising:

frames made of solid wood or wood in panel form, assembled by joining cross-pieces and uprights of the frames, with use of metal corner-brackets, positioned at four corners of the frames, and straps, or other elements which are resistant to traction, stretched about the frames;

housings with linear transversal profiles afforded in the wooden frames for housing metal or PVC elements;

metal or PVC elements fixed by means of screws to fixed and mobile frames of the frames, respectively in housings made in internal sides of the fixed frames and in external sides of the mobile frames;

hinges, seals and other mechanical components for guaranteeing closure, opening and operation of the frames.

7). The frames of claim 6, comprising fixed frames and mobile frames, assembled together by joining cross-pieces (13') and uprights (11') of the frames (10') with use of metal corner-pieces (16), threaded pivots (21) passing obliquely at corners of the frame, and straps (18) stretched between two ends (19, 20) of the threaded pivots (21) in such a way as to exert a traction on two sides of the corner of an intensity which obtains a perfect join of the cross-pieces (13') and the uprights (11') forming the corner.

8) The frames of claim 6, comprising fixed frames and mobile frames assembled by joining the cross-pieces (13') and the uprights (11') of the frames (10') with the use of threaded pivots (21) passing obliquely at corners of the frame, and corner-brackets (16') ends of which are constrained to pivots (51, 52) which are slidable with respect to housings (53, 54) lodged entirely in cavities afforded in the cross-pieces (13') and in the uprights (11') at ends (19', 20') of the pivot (21'); traction being exerted by means of screws (57, 48) interacting between the housings (53, 54) and supports (59, 60) of the pivots (51, 52), which traction guarantees an exact corner coupling of the cross-pieces (13') and the uprights (11').

9). A joint for union of elements to be used as cross-pieces (130) and uprights (110) comprising: at least one joint pivot (210) having a tension-rod function, housed snugly and coaxially inside a cylindrical housing (200) predisposed in a reciprocally-coupled cross-piece (130) and an upright (110); at least one block (530, 540), for interacting with means which are associable to the ends of the

joint pivot (210) for placing the tension-rod in a state of tension; the block (530, 540) being predisposed to be snugly housed in cavities (250) afforded in the cross-piece (130) and the upright (110); the block (530, 540) being shaped in such a way as to restore the shape of the element, cross-piece 130 or upright (110) when housed in the relative cavity (250) in which the cavity (250) is afforded.

10). The joint of claim 9, wherein the means associable to the ends of the joint pivot (210) for realising the tensioning of the joint pivot (210) comprise screws (300).

11). The joint of claim 10, wherein the block (530, 540) is delimited by a straight circular cylindrical surface dimensioned in order to afford a snug housing thereof in the cavities located in the cross-piece (130) and the upright (110).